

Clinical Research

A clinical study on “Computer vision syndrome” and its management with *Triphala* eye drops and *Saptamrita Lauha*

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Abstract

American Optometric Association (AOA) defines computer vision syndrome (CVS) as “Complex of eye and vision problems related to near work, which are experienced during or related to computer use”. Most studies indicate that Video Display Terminal (VDT) operators report more eye related problems than non-VDT office workers. The causes for the inefficiencies and the visual symptoms are a combination of individual visual problems and poor office ergonomics. In this clinical study on “CVS”, 151 patients were registered, out of whom 141 completed the treatment. In Group A, 45 patients had been prescribed *Triphala* eye drops; in Group B, 53 patients had been prescribed the *Triphala* eye drops and *Saptamrita Lauha* tablets internally, and in Group C, 43 patients had been prescribed the placebo eye drops and placebo tablets. In total, marked improvement was observed in 48.89, 54.71 and 06.98% patients in groups A, B and C, respectively.

Key words: Computer Vision Syndrome, *Saptamrita Lauha*, *Triphala* eye drops, Video Display Terminal.

Introduction

A Video Display Terminal (VDT) is commonly known as computer screen. The computer has become a common item in today's society. It is estimated that approximately 45 million workers directly use computers by staring into VDTs for hours continuously. Computers have increased the work efficiency and communications and have opened access to information like never before. Despite these contributions to the society, prolonged exposure to VDTs has been the cause of a visual and ergonomic disorder called “Computer Vision Syndrome” (CVS).^[1] CVS is a group of symptoms which crop up from the extended viewing of the VDT, when the demands of the task exceed the abilities of the viewer. Symptoms comprising CVS are dry and irritated eyes, eye strain/fatigue, blurred vision, red eyes, burning eyes, excessive tear secretion, double vision, headache, light or glare sensitivity, contact lens discomfort, slowness in changing focus, changes in color perception, and neck, shoulder and backache. These symptoms of CVS are due to ocular (ocular-surface abnormalities or accommodative spasms) and/or extra ocular (ergonomic) etiologies. It has also been shown that VDT users also have a higher incidence of complaints than non-VDT users in the same environment.^[2]

The catastrophic effect of the CVS has resulted in low performance and extreme discomfort to the sufferer. The symptoms being vague and slow in onset drift to intolerable severity by the time the sufferer seeks medical advice.

This problem is very new to medical science and is under investigation to explain the mechanism of the disease and to find a solution. The current understanding upholds meticulous work environment as a precaution and use of artificial tear or contact lens wetting solutions to suffice the symptoms. But with these treatments, the patients of CVS get only symptomatic relief.^[3] So, to find a better solution to this burning problem, this study was designed.

Drug selection

Though the ailment is a consequence of modern invention, *Ayurveda*, the ancient science of life can be of great help in dealing the modern occupational ailments by its preventive and therapeutic principles. Considering the *Dosha* involvement on the basis of symptoms, Ayurvedic remedies can be used to treat the condition. Therapeutic measures like *Kriya Kalpa*, *Shamana Aushadhis*, *Chakshushya* and *Rasayanas*, etc., which improve the homeostasis and ocular strength can be practised. CVS can be managed by Ayurvedic *Chakshushya* and *Vata-pitta* pacifying therapies. *Triphala* and *Saptamrita Lauha* are the formulations which have been extensively used for various eye disorders. The formulation selected is from reference quoted in *Bhaishajya Ratnavali*, *Netra Roga Prakarna* 64th chapter.^[4] *Triphala Arka* is prepared according to the *Arka Kalpana* and it was selected on the following grounds for topical application.

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DOI: 10.4103/0974-8520.72407

- *Triphala* is used for both local and internal administration in many forms for treating many of the ocular conditions.
- *Triphala* acts as the best *Rasayana* and *Chakshushya*^[5] drug without much discomfort.
- Among the four methods (eye drops, eye ointment, gel, ocuserts) of delivering ocular pharmaco-therapeutics, eye drop is the most commonly employed mode of administration.
- Eye drop is the simplest and most convenient method of topical application, especially for daytime use. Application in the form of eye drops makes the drug available for immediate action. As the distillate obtained through *Arka Kalpana* fulfils the above criteria, *Triphala* eye drops was selected for the clinical study.

So, *Triphala Arka* for topical application and *Saptamrita Lauha* for internal administration have been selected.

Saptamrita Lauha tablets were prepared in the pharmacy of Gujarat Ayurved University and *Triphala Arka* was prepared at Pharmaceutical laboratory of Gujarat Ayurved University and sterile packing was done at Indian Ophthalmics, Surendranagar.

Aims and objectives

The aim of present research was to evaluate the efficacy of *Triphala* eye drops and *Saptamrita Lauha* in the management of CVS.

Materials and Methods

Study design

In this clinical study, 151 patients from the Out-patient Department of *Shalakyta Tantra* of I.P.G.T. & R.A., G.A.U, Jamnagar, who were suffering from CVS and fulfilling the criteria of inclusion for the present study, were registered and divided randomly into three groups. An elaborative research proforma was specially designed for the purpose of incorporating all aspects of the disease on Ayurvedic and Modern parlance. Selected patients were randomly divided into three groups with the following drug schedule in a particular group:

Group A: *Triphala* eye drops; one drop in each eye, 4 times/day for 30 days;

Group B: oral administration of *Saptamrita Lauha* tablets, 500 mg BD with unequal quantity of *Madhu* and *Ghrita* and *Triphala* eye drops one drop in each eye, 4 times/day for 30 days and

Group C: oral administration of placebo tablets 500 mg, 2 times/day, and distilled water eye drops one drop in each eye, 4 times/day for 30 days.

Diagnostic criteria

To evaluate the *Chakshushya* activity of both the drugs, whole importance was given to the subjective complaints as no particular objective findings have been mentioned or available for diagnosis of this disease so far. So, in this present study, routine hematological investigations, routine eye examination including intraocular pressure, visual acuity and slit lamp examination, were carried out to exclude any other ocular pathology.

Inclusion criteria

- 1) Patients between 16 and 75 years of age.
- 2) Computer users complaining of eye strain, dry eyes, blurred vision, redness, burning eyes, excessive tears, double vision, headache, glare sensitivity, fatigue, neck, shoulder and back pain.
- 3) Patients having minimum three symptoms of CVS.
- 4) Minimum 1 hour exposure to any type of VDT like desktop, laptop or both.
- 5) Minimum 1 year exposure to any type of above-mentioned VDTs.

Exclusion criteria

- 1) Patients of age below 16 years or above 75 years.
- 2) Those having symptoms due to direct physiological effects of substance (e.g., drug abuse, medication) or a general medical condition (e.g., hypothyroidism).
- 3) Patients suffering from infectious conditions of the eye like conjunctivitis, scleritis, uveitis, glaucoma, stye, blepharitis, etc.
- 4) Patients having any fundus pathology like optic atrophy, diabetic retinopathy, hypertensive retinopathy, papilledema, etc.

Criteria for assessment

Drug was given to the patients in two intervals of 15 days each and the changes in subjective parameters were recorded during every visit. Total effect of therapy in each patient was evaluated after completion of treatment.

A specialized rating scale for chief complaints of CVS examination was prepared by giving scores to various presentations of CVS. The obtained data on the basis of observations were subjected to statistical analysis. Chi-square test was carried out for all subjective parameters (clinical features) and Student's paired "t" test was applied for the objective parameters like hematological investigations. The results were interpreted at the level of $P < 0.001$ as highly significant, $P < 0.01$ as moderately significant, $P < 0.05$ as significant and $P > 0.05$ as insignificant.

Observations and Results

In the present study, the maximum patients (63.12%) were between 16 and 35 years of age and male (66.67%) predominance was observed. The maximum patients (60.28%) were graduates and majority of the cases (64.53%) were service persons, followed by 27.65% students. Majority of the patients, i.e., 64.53% reported to work for a maximum of 01–05 hours/day on computer and majority of the patients, i.e., 64.53% were using computer since 1–5 years, and majority of them (56.74%) were using desktop as a regular VDT gadget. The results on chief complaints are shown in Table 1.

When computed statistically Group A and Group B with Group C by using Chi-square test, Group A patients showed significant improvement ($P < 0.05$) in the chief complaints over that of Group C in three symptoms, i.e., blurred vision, light and glare sensitivity, and eye strain/ fatigue.

Group B (*Saptamrita Lauha* and *Triphala* eye drops) patients showed statistically significant improvement ($P < 0.05$) in chief complaints over that of placebo with regard to three symptoms, i.e., dry and irritated eye, excessive secretion of tears, and light

Table 1: Effect of therapy on chief complaints

Chief complaints	Group A		Group B		Group C	
	n	% Improvement	n	% Improvement	n	% Improvement
Dry and irritated eyes	25	60.98	24	65.79	21	40.00
Eye strain/fatigue	39	63.08	50	67.86	41	20.30
Blurred vision	24	44.74	31	69.23	22	15.79
Red eyes	35	55.36	34	69.23	24	15.95
Burning eyes	37	65.08	46	77.33	37	52.38
Excessive tear secretion	25	51.22	31	58.33	25	19.05
Double vision	06	50.00	05	44.44	07	09.09
Headache	36	28.57	45	47.56	35	20.00
Light/glare sensitivity	26	55.81	30	59.57	17	16.67
Contact lens discomfort	03	41.33	04	55.56	01	100.00
Slowness in changing focus of eyes	06	44.44	09	42.86	04	16.67
Changes in color perception	01	100	02	00	00	00
Neck, shoulder and backache	22	20.51	19	29.63	09	00

or glare sensitivity test. Whereas, in relation to blurred vision and eye strain/fatigue, the significance was at the level of $P < 0.01$, and in the case of burning eyes, the test has shown highly significant effect with $P < 0.001$.

Total effect of therapy

Total effect of therapy was calculated by using paired “t” test in all the three groups.

In Group A, marked improvement was observed in maximum, i.e., 48.89% patients, moderate improvement in 13.33% patients and mild improvement in 37.78% patients.

Group B (combined therapy) showed marked improvement in 54.71% patients, moderate improvement in 22.64% patients, mild improvement in 15.09% and complete remission was obtained only in this group in 07.55% patients.

Group C (placebo) showed no effect in 44.19% patients, mild improvement in 39.53% patients, moderate improvement in 09.30% patients and only 06.98% showed marked improvement.

Overall effect of the therapy

Overall, it has been observed that treatment with *Triphala* eye drop gives a statistically significant difference at 1% level over placebo treatment, $P < 0.001$.

Overall, it has been observed that treatment with *Saptamrita Lauha* and *Triphala* eye drops makes statistically significant difference at 1% level over placebo treatment ($P < 0.001$).

Discussion

The incidence of CVS is as high as 50–90% among the employees whose occupation involves computers.^[6] It is estimated that approximately 45 million workers directly use computers, staring into VDTs for hours continuously.^[1] Also, a number of investigators have indicated that visual symptoms occur in 75–90% of VDT workers.^[7]

Hence, computer users are invariably exposed to the risk of developing CVS, leading to marked deterioration in performance owing to the severity and persistence of disorders.

Probable mode of action

The reference quoted as per *Bhaishajya Ratnavali* suggests that *Saptamrita Lauha* not only cures various *Netra Rogas* but also acts as *Rasayana*. All the constituents of *Saptamrita Lauha*, i.e., *Haritaki*, *Vibhitaki*, *Aamalaki*, *Yashtimadhu*, *Lauha Bhasma* have the *Tridoshaghna* properties, especially helping in *Vata-Pitta Shamana* by their *Gunas* like *Guru*, *Snigdha*, *Mridhu*, *Ushna*, *Sheeta*, *Rooksha*, *Laghu*. Five of these drugs have *Sheeta Veerya*, whereas the other two drugs have *Ushna Veerya* and all the drugs have *Madhura Vipaka*. Only *Madhu* has *Katu Vipaka*. *Ghrta* is the drug of choice in *Netra Rogas*. Because of its *Sanskaranuvaratana Guna*, *Sheeta Veerya* and *Madhura Vipaka*,^[8] it helps in pacifying the *Pitta Dosh*. So, these drugs reduce the vitiated *Doshas* and help in correcting the pathology of the disease. By virtue of its *Rasayana* and *Chakshushya* properties, it helps to increase the strength of the organ, which in turn increases the speedy recovery from its pathological state.

Triphala eye drops relieve the eye strain and strengthen the visual function. The fruit triad of *Haritaki*, *Vibhitaki*, *Aamalaki* holds excellent in Ayurvedic ocular therapies, as it is prescribed for the treatment of many ocular diseases in the different forms. *Triphala* has *Tridoshaghna* property; so, it also helps in reversing the disease by reversing the vitiated *Vata-Pitta Doshas* by its *Gunas* like *Ruksha*, *Laghu*; *Sheeta*, *Guru*, and with *Panch Rasatmaka Lavana Varjita Kashaya Rasa*. Also, *Triphala* in the eye drops form helps to reduce the local symptoms as well as it strengthens the eye. Application of *Triphala* in the form of eye drops makes the drug available for immediate action.

Thus, both the drugs help to increase the ocular strength, which in turn increases the organ's capacity to overcome its pathological condition.

Conclusion

Computer has become an integral part of office equipments. Because computer use is such a high visual demanding task, vision problems and symptoms have become very common at today's workplace. The symptoms can vary but mostly include

eye strain, headache, dry and irritated eyes, light sensitivity and double vision. The causes for these symptoms are a combination of individual problems, poor workplace conditions and improper work habits.

Computer users are invariably exposed to the risk of developing “CVS” leading to marked deterioration in performance owing to the severity and persistence of disorders. So, abstinence from cause is the ideal solution but it is far from practicality in the case of CVS.

The application of eye drops constitutes the basic therapeutic approach in combating most of the symptoms of CVS. Hence, it can be implemented in all the areas of computer utility; it is most feasible, economical and easily accessible.

Further studies can be done at the campus level of computer users, so that the observations can be noted well and can be better suggested when there is regular communication between the computer professionals and the research scholar.

Acknowledgment

The authors would like to express sincere thanks to Dr. Manjusha Rajagopala M.D. (Ayu.), Ph.D., for her constant support and innovative suggestions, without which this study would have not

been possible. The authors are also grateful to authorities and members of research committee of I.P.G.T. & R.A. for providing the available facilities for conducting this work. Lastly, the authors acknowledge all the patients for their willingness and full cooperation during this study.

References

1. Sheedy JE, Shaw-McMinn PG. Diagnosing & treating Computer: Related vision problems. Boston: Butterworth Heinemann; 2003. ISBN 0-7506-7404-0.
2. Anshel J. Visual Ergonomics Handbook. 1st ed., Chapter 1. Editor(s): Jeffrey Anshel, Corporate Vision Consulting, Encinitas, California, USA : Taylor & Francis Grp; 2005. p. 24.
3. Available from: <http://www.springerlink.com/content/k55681310736n273/> [last cited on 2009 Oct 16].
4. Acharya GD. Bhaishajya Ratnavali. 8th ed. New Delhi: Motilal Banarasis; 1970.
5. Sushruta-Sushruta Samhita, Chowkhambha Sanskrit Pratishthan; Reprint 2008, Sutra Sthana 38/57.
6. Available from: <http://www.helium.com/items/342835-computer-vision-syndrome> [last cited on 2009 Oct 16].
7. Available from: http://www.copperwiki.org/index.php/Computer_Related_Ailments [last cited on 2009 Oct 16].
8. Agnivesha, 'Charaka Samhita', revised by Charaka and Dridhbala with 'Ayurveda Dipika' commentary, by Chakrapanidatta, edited by Vaidya Jadavaji Trikamaji Acharya, Krishnadas Academy, Gopal Mandir Lane, Varanasi -221 001, (India), reprint 2000. Sutra Sthana 13/13.

हिंदी सारांश

“कम्प्यूटर विजन सिंड्रोम” का नैदानकीय अध्ययन एवं
त्रिफला आई ड्रॉप्स और सप्तामृत लौह द्वारा इसकी चिकीत्सा

गंगम्मा.एम.पी, पूनम, मंजूषा राजगोपाल

अमेरिकन ओप्टोमीट्रिक एसोसिएशन (ए.ओ.ए.) की परिभाषा के अनुसार कम्प्यूटर विजन सिंड्रोम आंख और देखने की प्रक्रिया विशेषतः समीप कार्यों से संबंधित लक्षणों का समूह है, जो कम्प्यूटर पर अधिक कार्य करने से उत्पन्न होता है। अधिकांश अध्ययन यह दर्शाते हैं कि यह रोग वी.डी.टी.(कम्प्यूटर) पर काम करने वालों में ज्यादा पाया जाता है। आंखों से संबंधित लक्षणों के उत्पन्न होने का मुख्य कारण उस व्यक्ति की अन्य आंख संबंधी तकलीफें और कार्यस्थल का स्वस्थ वातावरण न होना है। कम्प्यूटर विजन सिंड्रोम पर किये गये इस चिकित्सीय अध्ययन में कुल १५१ रोगियों का पंजीकरण किया गया जिनमें से १४१ रोगियों ने चिकित्सा पूर्ण की। ग्रुप ‘ए’ में ४५ रोगियों को त्रिफला आई ड्रॉप्स दिए गए एवं ग्रुप ‘बी’ में ५३ रोगियों को त्रिफला आई ड्रॉप्स आंखों में डालने के लिए व खाने के लिए सप्तामृत लौह की गोलियां दी गईं तथा ग्रुप ‘सी’ में ४३ रोगियों को प्लेसिबो आई ड्रॉप्स व प्लेसिबो गोलियां दी गईं। ग्रुप ए, बी व सी में क्रमशः ४८.८९%, ५४.७१% तथा ०६.९८% रोगियों में अत्याधिक लाभ प्राप्त हुआ।